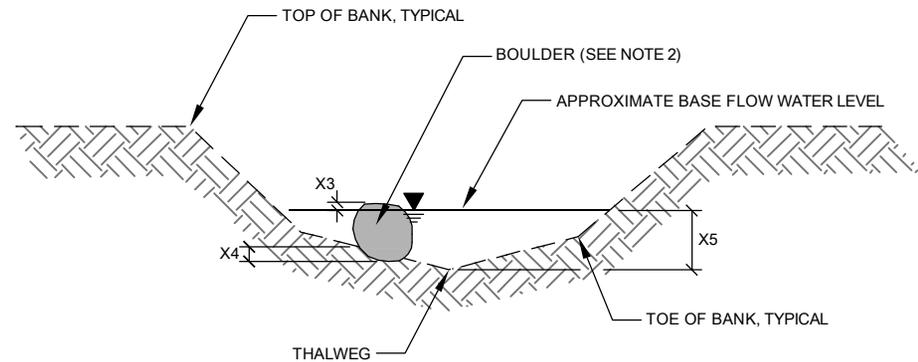


CROSS SECTION A - A'



CROSS SECTION B - B'

THIS FIGURE IS ONLY MEANT TO DEFINE THE MINIMUM INFORMATION REQUIRED BY THE CITY OF CHARLOTTE TO BE INCLUDED IN A DETAIL FOR THIS TYPE OF TECHNIQUE. THIS FIGURE IS NOT MEANT TO REPRESENT A STANDARD DESIGN METHOD FOR THIS TYPE OF TECHNIQUE AND SHALL NOT BE USED AS SUCH.

NOT TO SCALE



CHARLOTTE-MECKLENBURG
STORM WATER SERVICES
GENERIC DETAIL REQUIREMENTS

BOULDER CLUSTER

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NOTES:

1. A BOULDER CLUSTER TURBULENT RIFFLE SHALL BE INSTALLED IN GLIDE/RIFFLE (STRAIGHT) CHANNEL SECTIONS ONLY WITH THE TOPS OF THE BOULDERS SET VERY NEAR OR BELOW THE NORMAL (BASE FLOW) WATER SURFACE.
2. THE BOULDER CLUSTER TURBULENT RIFFLE SHALL BE CONSTRUCTED WITH BOULDERS OF A SIZE (LENGTH, WIDTH, AND DEPTH [THICKNESS]) AS SPECIFIED BY THE DESIGNER.
3. PLACEMENT DIMENSIONS OF THE BOULDERS RELATE TO THE BOULDER DIMENSIONS. THE DESIGNER SHALL SPECIFY ALL DIMENSIONS IN THE DETAIL:
 - A. THE PLACEMENT OF ADJACENT BOULDERS SHALL NOT BLOCK THE STRAIGHT, DOWNSTREAM FLOW VECTORS IN THE CHANNEL. THUS THE MINIMUM LATERAL DISTANCE BETWEEN THE BOULDERS SHALL BE AT LEAST ONE-HALF OF THE MEASUREMENT OF THE LATERALLY-PLACED AXIS OF THE BOULDER.
 - B. BOULDERS SHALL BE SPACED ABOUT 1/3 OF THE BANKFULL CHANNEL WIDTH APART AND NO MORE THAN TWICE THE MAXIMUM AXIS MEASUREMENT OF THE BOULDERS APART.
 - C. THE BOULDERS SHALL BE EMBEDDED INTO THE STREAM BOTTOM A MINIMUM DEPTH EQUALING ONE-THIRD TIMES THE BOULDER THICKNESS.
4. NO MORE THAN 3 INCHES OF BOULDER SHOULD BE EXPOSED ABOVE BASEFLOW. IF THE BOULDER CLUSTER TURBULENT RIFFLE IS INSTALLED IN DRY CONDITIONS, ADJUSTMENTS TO BOULDER PROTRUSION ABOVE THE BASE FLOW WATER SURFACE MAY BE REQUIRED ONCE FLOW RESUMES.



PHOTO: BOULDER CLUSTER

DIMENSIONS (VALUES TO BE PROVIDED BY DESIGNER)			
VARIABLE	VALUES	TYPICAL UNIT	DESCRIPTION
X1		IN. OR FT.	MINIMUM LATERAL DISTANCE BETWEEN BOULDERS
X2		IN. OR FT.	MINIMUM LONGITUDINAL DISTANCE BETWEEN BOULDERS
X3		IN. OR FT.	HEIGHT OF EXPOSED BOULDER SURFACE ABOVE/BELOW BASEFLOW
X4		IN. OR FT.	MINIMUM DEPTH OF BOULDER EMBEDMENT
X5		IN. OR FT.	APPROXIMATE DEPTH OF BASEFLOW
X6		IN. OR FT.	BOULDER LENGTH
X7		IN. OR FT.	BOULDER WIDTH
X8		IN. OR FT.	BOULDER THICKNESS

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